

Serial No. 09/736,795

IN THE CLAIMS:

Each of the claims that remains pending and under consideration in the above-referenced application is reproduced below, in clean form. A marked-up version of each of the amended claims is also enclosed herewith to clearly identify the changes that have been made to each amended claim.

Please cancel claims 5, 23, and 27 without prejudice or disclaimer.

Please enter the claims as follows:

See 617

1. (Twice amended) A method of disposing a conductive structure on at least one contact pad on an active surface of a semiconductor device substrate, comprising:
disposing a layer comprising polymeric material over the substrate;
imparting said layer with a thickness substantially equal to a desired height of the conductive structure;
forming at least one aperture through said layer to expose at least a portion of the at least one contact pad;
disposing a quantity of conductive material on said layer and permitting said conductive material to substantially fill said at least one aperture;
bonding said conductive material within said aperture to the at least one contact pad to form a conductive structure of substantially said desired height; and
at least partially exposing a lateral periphery of the conductive structure through said layer.

2. (Previously amended) The method of claim 1, wherein said disposing said quantity of conductive material on said layer comprises disposing a quantity of substantially molten conductive material on said layer.

3. The method of claim 2, wherein said bonding is effected as said quantity of substantially molten conductive material solidifies in said at least one aperture.

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4. The method of claim 1, wherein said disposing said layer comprises adhering a film to a surface of the substrate.

C2 sub 617 6. (Twice amended) The method of claim 1, wherein said disposing said layer comprises placing a quantity of polymeric material on the substrate, and wherein said imparting comprises spreading said polymeric material to a substantially consistent thickness over at least a portion of a surface of the substrate.

7. The method of claim 1, wherein said forming said aperture occurs prior to said disposing said layer over the substrate.

8. The method of claim 1, wherein said forming said aperture comprises etching said aperture through said layer.

9. The method of claim 8, wherein said etching occurs following said disposing said layer over the substrate.

M3 917 10. (Twice amended) The method of claim 1, wherein said at least partially exposing said lateral periphery of the conductive structure comprises substantially removing said layer from the substrate.

11. The method of claim 10, wherein said removing comprises etching said layer.

12. The method of claim 10, wherein said removing comprises peeling said layer away from the substrate.

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C4 6/17 13. (Amended) The method of claim 1, wherein said at least partially exposing said lateral periphery of the conductive structure comprises reducing said thickness of said layer.

14. The method of claim 13, wherein said reducing said thickness comprises at least partially etching said layer.

15. The method of claim 13, wherein said reducing said thickness comprises shrinking said layer.

16. (Previously amended) The method of claim 15, wherein said shrinking comprises exposing said layer to radiation, exposing said layer to a shrinking agent, or exposing said layer to a plasma.

C5 6/17 17. (Twice amended) The method of claim 1, wherein said at least partially exposing said lateral periphery comprises exposing said layer to a solvent.

18. The method of claim 1, wherein said disposing said quantity of conductive material comprises immersing a surface of the substrate having said layer disposed thereon within a quantity of molten conductive material.

19. The method of claim 1, wherein said disposing said quantity of conductive material comprises disposing solder on said layer.

20. The method of claim 1, wherein said disposing said quantity of conductive material comprises disposing conductive elastomer on said layer.

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21. (Previously amended) The method of claim 1, wherein said forming said aperture comprises exposing a portion of said at least one contact pad located within a periphery thereof.

22. (Twice amended) A method of forming a solder mask, comprising:
disposing a solder mask material comprising a polymer onto an active surface of a substrate;
forming a layer of said solder mask material having a substantially consistent thickness on the active surface of said substrate, said thickness of said layer being substantially equal to a desired conductive structure height; and
forming at least one aperture through said layer in a location corresponding to a location of at least one contact pad of said substrate to expose said at least one contact pad through said solder mask, said solder mask material facilitating a reduction in said thickness when a conductive structure has been at least partially formed in said at least one aperture.

24. The method of claim 23, wherein said disposing and said forming said layer are effected substantially simultaneously.

25. (Twice amended) The method of claim 23, wherein said forming said layer comprises planarizing said layer.

26. The method of claim 25, wherein said planarizing comprises chemical-mechanical polishing.

28. (Amended) The method of claim 22, wherein said forming said layer comprises softening or melting said solder mask material.

29. (Twice amended) The method of claim 28, wherein said forming said layer comprises spinning said solder mask material over said active surface.

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30. (Twice amended) The method of claim 28, wherein said forming said layer comprises spreading said solder mask material across said active surface.

31. (Previously amended) The method of claim 22, wherein said forming said at least one aperture comprises etching a region of said layer.

32. (Previously amended) The method of claim 22, wherein said at least one solder mask material comprises a photosensitive polymeric material and wherein said forming said at least one aperture comprises exposing a region of said photosensitive polymeric material disposed over said at least one contact pad to form said at least one aperture through said layer.

33. (Amended) A method of exposing at least a portion of a lateral periphery of a conductive structure on a semiconductor device, comprising reducing a thickness of a solder mask that comprises polymeric material disposed around said lateral periphery.

34. The method of claim 33, wherein said reducing said thickness comprises irradiating said solder mask, exposing said solder mask to a plasma, or exposing said solder mask to a shrinking agent.

35. The method of claim 33, wherein said reducing said thickness comprises selectively etching a material of said solder mask with respect to the conductive structure.

36. (Amended) A method of exposing a conductive structure that protrudes from a surface of a semiconductor device through a solder mask that comprises a polymeric material positioned on the surface of the semiconductor device, comprising:
reducing a thickness of least portions of the solder mask laterally surrounding the conductive structures

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37. The method of claim 36, wherein said reducing comprises reducing a thickness of substantially all of the solder mask.

38. The method of claim 36, wherein said reducing comprises exposing the solder mask to at least one of radiation, a plasma, and a shrinking agent.

39. The method of claim 36, wherein said reducing comprises removing a material of the solder mask with selectivity over a material of the conductive structures.

40. The method of claim 39, wherein said removing comprises etching the material of the solder mask with selectivity over the material of the conductive structures.